

A Sample Delivery System for Planetary Missions

Completed Technology Project (2015 - 2016)



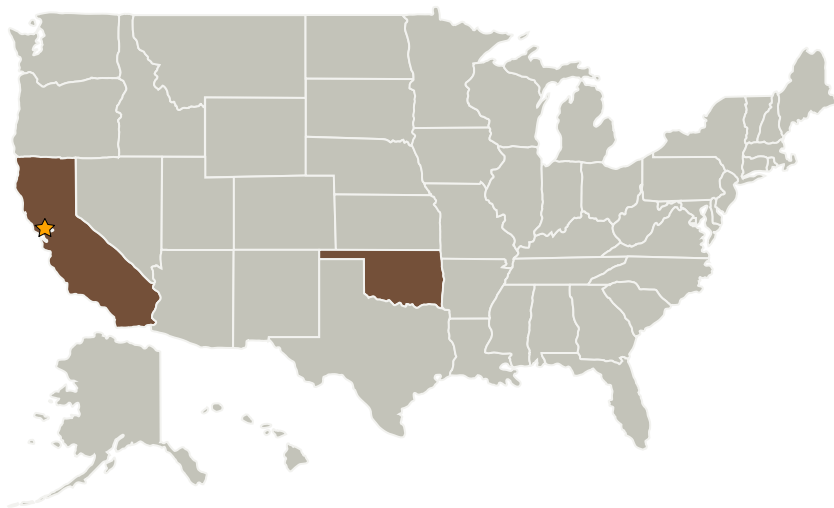
Project Introduction

The project will develop, test and characterize the performance of a prototype /sample delivery system (SDS) implemented as an end effector on a robotic arm capable of digging or receiving cuttings from a drill. The device will be tested in Mars conditions with soils and ices including drill cuttings acquired from important Mars analogs including Antarctica soils and icy samples that are sticky. Motor current, sample delivery rates and particle deposition trajectories from the SDS into mockup instrument inlets will be measured in Mars conditions. HOW IT WORKS: A rotating wire brush (Fig 2) pushes samples through a grate (Fig 3) with spacing set to limit particle size. Small particles pass through the grate. The larger particles are jettisoned when the robot arm rotates the scoop upside down. Running the brush in reverse ejects any sticky particles.

Anticipated Benefits

Potential customers and Applications: The Ames Research Center (ARC) proposed Icebreaker mission. Other NASA planetary missions that require sample handling, filtering and quantity dispensing control.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Center Innovation Fund: ARC CIF

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Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
KISS Institute for Practical Robotics(KIPR)	Supporting Organization	Academia	Oklahoma

Primary U.S. Work Locations	
California	Oklahoma

Project Website:
<https://www.nasa.gov/directorates/spacetech/home/index.html>
Project Management**Program Director:**

Michael R Lapointe

Program Manager:

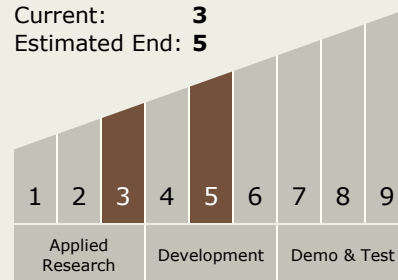
Harry Partridge

Principal Investigator:

Carol R Stoker

Technology Maturity (TRL)

Start: **3**
 Current: **3**
 Estimated End: **5**

**Technology Areas****Primary:**

- TX08 Sensors and Instruments
 - TX08.3 In-Situ Instruments and Sensors
 - TX08.3.3 Sample Handling